CLAIMS

What is claimed is:

1. In a Foreign Agent, a method of registering a mobile device with a Home Agent in an asymmetric link environment, the method comprising:

associating each of one or more interfaces of the Foreign Agent with a different care-of address;

sending an agent advertisement including the care-of address for the one or more interfaces of the Foreign Agent via one or more uplinks;

receiving a registration request forwarded via a downlink router, the registration request identifying a care-of address associated with one of the one or more interfaces of the Foreign Agent;

ascertaining one of the interfaces identified by the care-of address, thereby identifying the interface to which the mobile device has roamed;

forwarding the registration request to the Home Agent; receiving a registration reply from the Home Agent; and forwarding the registration reply to the mobile device via the ascertained interface.

- 2. The method as recited in claim 1, wherein the mobile device is a mobile router.
- 3. The method as recited in claim 1, wherein the mobile device is a mobile node.
- 4. The method as recited in claim 1, wherein the downlink router is a Foreign Agent.
- 5. The method as recited in claim 1, wherein the asymmetric link environment includes one or more satellites.

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- 6. The method as recited in claim 1, wherein the registration request further includes an extension including a source MAC address of the mobile device.
- 7. The method as recited in claim 6, wherein the registration reply includes a destination MAC address that is the source MAC address of the mobile device.
- 8. The method as recited in claim 1, wherein the registration request includes a destination IP address field having a value of the care-of address from the agent advertisement.

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- 9. The method as recited in claim 1, further comprising: entering the registration request in a pending registration request list; and updating the pending registration request list when the registration reply is received from the Home Agent.
- 10. The method as recited in claim 1, further comprising:

 marking the registration request as having been received on the interface advertising the care-of address.

11. The method as recited in claim 10, wherein marking the registration request as having been received on the interface advertising the care-of address comprises:

updating a pending registration request list to indicate that the registration request has been received on the interface advertising the care-of address.

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12. The method as recited in claim 1, wherein the registration reply includes a destination MAC address that is a broadcast address.

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13. The method as recited in claim 1, wherein the registration reply includes a

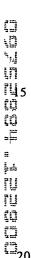
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14. In a downlink router, a method of forwarding a Mobile IP registration request in an asymmetric link environment, the method comprising:

receiving a registration request composed and sent by a mobile device, the registration request identifying a care-of address associated with one of one or more interfaces of a Foreign Agent;

forwarding the registration request to the Foreign Agent, thereby enabling the Foreign Agent to process the registration request and forward a registration reply to the mobile device via the interface.

- 15. The method as recited in claim 14, wherein the mobile device is a mobile router.
- 16. The method as recited in claim 14, wherein the mobile device is a mobile node.
- 17. The method as recited in claim 14, wherein the registration request includes a time to live field having a value that is greater than one.
- 18. The method as recited in claim 14, wherein the downlink router is a Foreign Agent.
- 19. The method as recited in claim 14, wherein the asymmetric link environment includes one or more satellites.
- 20. The method as recited in claim 14, wherein the registration request further includes an extension including a source MAC address of the mobile device.
- 21. The method as recited in claim 14, wherein the registration request includes a destination IP address field having a value of the care-of address.



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22. A Foreign Agent that supports Mobile IP, the Foreign Agent being capable of registering a mobile device with a Home Agent in an asymmetric link environment, the Foreign Agent comprising:

a processor; and

a memory, at least one of the processor and the memory being adapted for:
associating each of one or more interfaces of the Foreign Agent with a different
care-of address;

sending an agent advertisement including the care-of address for the one or more interfaces of the Foreign Agent via one or more uplinks;

receiving a registration request forwarded via a downlink router, the registration request identifying a care-of address associated with one of the one or more interfaces of the Foreign Agent;

ascertaining one of the interfaces identified by the care-of address, thereby identifying the interface to which the mobile device has roamed;

forwarding the registration request to the Home Agent; receiving a registration reply from the Home Agent; and forwarding the registration reply to the mobile device via the ascertained interface.

23. A computer-readable medium, the computer-readable medium being adapted for enabling a Foreign Agent that supports Mobile IP to register a mobile device with a Home Agent in an asymmetric link environment, comprising:

instructions for associating each of one or more interfaces of the Foreign Agent with a different care-of address;

instructions for sending an agent advertisement including the care-of address for the one or more interfaces of the Foreign Agent via one or more uplinks;

instructions for receiving a registration request forwarded via a downlink router, the registration request identifying a care-of address associated with one of the one or more interfaces of the Foreign Agent;

instructions for ascertaining one of the interfaces identified by the care-of address, thereby identifying the interface to which the mobile device has roamed;

instructions for forwarding the registration request to the Home Agent;

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instructions for receiving a registration reply from the Home Agent; and instructions for forwarding the registration reply to the mobile device via the ascertained interface.

24. A Foreign Agent that supports Mobile IP, the Foreign Agent being capable of registering a mobile device with a Home Agent in an asymmetric link environment, the

Foreign Agent comprising:

means for associating each of one or more interfaces of the Foreign Agent with a different care-of address;

means for sending an agent advertisement including the care-of address for the one or more interfaces of the Foreign Agent via one or more uplinks;

means for receiving a registration request forwarded via a downlink router, the registration request identifying a care-of address associated with one of the one or more interfaces of the Foreign Agent;

means for ascertaining one of the interfaces identified by the care-of address, thereby identifying the interface to which the mobile device has roamed;

means for forwarding the registration request to the Home Agent; means for receiving a registration reply from the Home Agent; and

means for forwarding the registration reply to the mobile device via the ascertained